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ABSTRACT

Based on an examination of the organizational features of editing during collaborative computer writing in a combined first and second grade classroom in a Catholic school during the 1985-86 school year, this paper argues that there is a fundamental difference between collaborative and solo computer writing, and that collaboration during computer editing sessions depends on a social organization which serves both instrumental and moral values. The essay begins by describing the research methodology used and the type of collaboration addressed, i.e., one in which one student is designated as the writer and the other as the helper. The role of the computer in the editing process is then described, and the rights and responsibilities of the writer and the helper are also considered, including value dimensions of collaborative editing. It is proposed that the relation between writer and helper rights and responsibilities for arranging be seen as an organization of preference. A rule system for arranging which is realized through machinery for discourse and action during collaborative computer writing is described, and differences between such machinery and naturally-occurring conversation are discussed. Conversations and actions in four cases from a videotaped computer writing session are presented to support the claim for an organization of preference for writer over helper in arranging text. It is concluded that the various socially organized ways people have of using computers, both collaboratively and individually, warrant further attention before decisions can be made on how computers should be used in classrooms. Extensive notes, a list of 34 references, and four appendices are included. (MES)

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ORGANIZATIONAL FEATURES OF COLLABORATIVE EDITING ACTIVITIES
AT A COMPUTER

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ORGANIZATIONAL FEATURES OF COLLABORATIVE EDITING ACTIVITIES AT A COMPUTER

A wide variety of persons share interests in a wide variety of questions concerning computers in schools. Some of these questions can be ordered, and I would like to offer one ordering as a way of framing a micro-level analysis of student keyboarding practices during collaborative computer editing.

The largest or most general question is no longer whether computers should be used in schools, but how they should be used. One use which strikes me as most sensible is wordprocessing. If the computer is to be used for wordprocessing, at what grade levels ought it to be so used? If we believe, as I do, that wordprocessing should be done at the early Primary level, then the question is how it ought to be organized. Among the many questions to be asked, e.g., regarding hardware (stand-alone, networked, brand, peripherals), software (power vs ease of use), and ergonomics (how ought the computer work station be designed?), there is one question that has received little consideration (but see Dickinson, 1985). Should the computer be used in a solo mode, with one student working at it, or should it be used in a collaborative mode, with two or more students working at it?

In order to answer the question of which mode of use is preferable, and under what conditions, we need accounts of how students do wordprocessing in solo and collaborative modes. We know some things, or at least have uncontroversial theories, about writing (Hayes and Flower, 1980; Scardamalia and Bereiter, 1985). These apply to solo writing, and thus, one would presume, to writing at the computer. There are differences, though, between solo and collaborative writing. Partly, those differences have to do with the problem of collaborators making visible, and coordinating, their solutions to the "production requirements" of task-oriented action (see Heap, forthcoming). However, we cannot know what the differences are between solo and collaborative computer writing until we have accounts of how each is done and can be done. In my view, we need analyses of the socio-cultural organization of computer writing in both modes if we are to have persuasive grounds for deciding if and when the computer should be used, at the Primary level, in a collaborative mode.

In what follows I shall focus on some organizational features of editing during collaborative computer writing in a combined grade one and two classroom. The features of interest are related as an organization of preference: a preference for the writer doing "arranging" moves over the helper doing "arranging" moves. Arranging moves are keyboard actions directed at arranging characters on the computer monitor. These moves are achieved by striking "executive keys" rather than striking keys which display characters on the screen.

Based on analyses of interaction where the preference organization of arranging is displayed, I shall argue that there is a fundamental difference between collaborative and solo computer writing.

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PART I

RESEARCH

The research which forms the basis for my argument is a three year SSHRC of Canada project on the socio-cultural organization of collaborative writing. Data were collected during the 1985-86 school year in a combined First and Second Grade classroom in a Catholic school. There were 32 students in the class, many of whom had repeated, or were repeating a grade. The school was located in a working class neighborhood of a major Canadian city. The neighborhood had a mix of Southern European ethnic groups represented, largely Italian and Portuguese.

Data were collected primarily through video and audiographic means. To provide a basis for comparison, 23 hours of videotaping was done in the Fall of 1985 of students working at the Writing Centre (two tables with six chairs, paper, pencils, erasers and various writing resource materials). In the Spring of 1986, 37 hours of videotaping was done of students wordprocessing at the Computer Centre (one Apple II+ computer and a dot matrix printer).

At the Computer Centre, a camera was mounted overhead and provided a view of student use of the keyboard. A second camera was mobile and provided a side angle view of the children as they faced the computer's monitor. A second computer monitor was placed facing the mobile camera so that an image of the screen would appear in the side angle view of the children.

Both cameras' signals were fed into a special effects generator, resulting in a portion of the image from the first camera appearing on a TV monitor in the bottom right hand corner of the image from the second camera. A stopwatch timer appears in the lower left of the screen, marking the tape in tenths of seconds. A second videorecorder was connected directly to the students' computer and was used to capture all screen states during computer use. Microphones were placed at the Computer Centre, the Writing Centre and at the teacher's desk. These and were controlled through an audio mixer (see Heap and Moore, 1986).

The teacher was the co-author of the wordprocessing program used in the class and was a pioneer in introducing wordprocessing at the early Primary level. We interviewed her repeatedly. She filled out a profile for us on each student in the class. Two sets of fieldnotes were taken each day. Student writings were collected, including the multiple drafts produced at the computer.

Methods of analysis derive from prior work in Interpretive Sociology, Ethnomethodology and Conversation Analysis, especially on the social organization of reading activities (e.g., Heap, 1985). Transcripts are being produced which represent discourse, non-verbal actions, and untitled screen state changes (changes on the computer monitor which are produced/entered in an uninterrupted serial order). For purposes of transcription and analysis a high-quality videorecorder is used which allows viewing of tapes at controllably slow speeds. Drawing from the methodologies of Husserlian Phenomenology and Oxbridge Analytic Philosophy, the aim of the analysis of data is to formulate the culturally possible ways in which writing can be (said to be) organized at the Primary level, with particular attention to collaborative computer writing.

COLLABORATION

The type of collaboration which I shall address is of a kind where one student is the designated writer and the other is the designated helper. I say "designated" because these labels are just that, they are not necessarily descriptive of what each student does at the computer while collaborating. When it was their turn to write the teacher allowed each student to select a helper, but retained a veto over the writer's choice.

This type of "assisted writing" is fostered and developed by the teacher in the classroom where we did our observations as a way, primarily, of assuring technical help to the writer without unnecessarily taking up the teacher's time. Ostensively, the helper is someone who knows more about how to use the computer (qua hardware and software) than the writer. This claim was true in late Autumn when the computer was introduced into the classroom, but its truth became tarnished as the year wore on. By May the helper was usually someone selected by the designated writer on the basis of friendship (or, hoped-for friendship).

Due to technical problems with the classroom printer, the editing of stories did not begin until the Spring. This meant that for editing sessions a writer likely would end up with a friend as a helper, who knew little more than the writer about using the computer. In retrospect, this was unfortunate, because the commands needed to do editing, and even the apparent functions of already familiar keystrokes, were ones little used in composing (1). When the going got tough, the collaborators called on their favourite student experts for help. One boy was the ultimate expert, with one male pretender to the throne. Two girls were experts. Rather more students than these volunteered as experts.

Boys tended to help boys, and girls tended to help girls. When expert help was needed, girls tended to call on girls, and boys always called on boys. And when the teacher was called on, she sent the ultimate expert, or the pretender, who, likely as not, was already hanging around the computer anyway.

PART II

EDITING

Editing is conceived here in both a wide and narrow sense. Widely, editing is the preparation of a text for reading. Narrowly, for the analysis of interaction, editing is conceived as the preparatory work done by teacher and student(s) to reform one draft of a story into a final draft. (In any particular case, the latter may turn out to be just the next draft: more corrections may be necessary.)

Editing narrowly conceived has two phases: 1) Hard Copy Correction, and 2) Correction Interpretation and Screen Document Reformation. These phases are present for both solo and collaborative computer writing. The first is carried out by the teacher, with the student or students having rights and responsibilities to respond to teacher queries. The material focus of this phase is a hard copy of a story written on the computer by one of the students. The second phase is carried out by the students, at the computer, generally without teacher direction or supervision. This phase has two material foci: the corrected hard copy and the screen state of the computer.

Correction Interpretation is the work of locating corrections made by the teacher on the hard copy, and interpreting them in terms of what is to be changed and what the changes will need to be.

Screen Document Reformation is the work of translating the corrections into sets of actions which will reform the story on the screen into a corrected facsimile of the hard copy. The latter is not a reproduction of the corrected hard copy: no pencil marks, crossouts or hand printed words appear on the screen. It is a facsimile based on the students' interpretation of what the teacher wants the story to look like (at the document level: signs and symbols arranged on a surface; see Heap, 1977).

COMPUTERS AND WRITING

One difficulty with extant theories of writing, with rare exception (Bereiter, 1980), is that they often mistake typical features of writing with styli (2) for essential features of writing. When the computer is used as the medium of expression in writing, a distinction must be introduced within frameworks proposed by cognitive theorists (e.g., Hayes and Flower, 1980). In using the computer to write we still compose, but "transcribing"--putting down our thoughts-- becomes differentiated into two types of operations. In phenomenological terms (cf. Husserl, 1962), the operations have three components: act, instrument and object. They are organized as follows.

ACT	>>	INSTRUMENT	>>	OBJECT
1. inputting		display keys		signs & symbols
2. arranging		executive keys		document

Acts of inputting operate through, and on, display keys to produce signs and symbols on some type of display screen. Acts of arranging operate through, and on, executive keys to arrange the signs and symbols on the screen. Transcribing acts are defined as inputting or arranging in terms of their effect on the display screen. While the keys achieve these effects, they do so in ways much more complicated than the ways in which other instruments, such as styli and even typewriters, achieve their effects.

Glossing much that needs examination, it can be said that keys are indexical (Heap, 1975): their effects are program dependent. What may achieve the display of a sign on the screen at one point in the use of a program, may at some other point achieve an executive effect on the screen document. For example, in the word processing program WordStar, depressing the "D" key at the "Opening Menu" initiates the sequence for opening a file to edit. Whereas, within a file, depressing the "h" key (alone) produces a "d" on the screen. (Pressing the "D" key while holding down the SHIFT key, or while in a CAPS LOCK mode, produces a "D" on the screen.)

The functional differentiation of keys on the computer keyboard, as supported by a software program, makes possible the differentiation of writing qua transcribing, into acts of inputting and arranging. Some keys are used to achieve displays on the screen, while others, "executive keys," are used to move the cursor, to delete signs and symbols, to bring up new screens, or windows on the screen. Executive keys are also used to move characters around on the screen, and to move characters to, and off, the screen. Depending on the computer hardware and software, some keys will allow characters to be inserted in certain ways on the screen. Some keys, when depressed in tandem with display keys, produce a further set of displays, such as upper case letters, and symbols such as !@#\$%^&*(). (see Appendix A)

EDITING AND KEYBOARDING

While editing has received some attention in the literature (Graves, 1983), close attention has yet to be given to how editing is done at the computer by young novices. The functional differentiation of keys on the keyboard which I have outlined for the composing phase of writing is a differentiation which was present as well when students in our study began editing/correcting their stories at the computer. While there were no differences in the actual functions of keys between the composing and editing phases of computer writing, in collaborative editing the distribution of rights and responsibilities realized by student actions differed from the distribution realized during the composing phase of collaborative computer writing (see Heap, forthcoming).

PART III

RIGHTS AND RESPONSIBILITIES

In the class we observed, when it was the writer's turn to write, the story that was written was the writer's story, not the helper's story. Ownership of the story flowed from the allocation of a turn to write at the computer. This ownership feature was carried over into the editing phase of Correction Interpretation and Screen Document Reformation. The helper who was selected to assist during the composing segment generally continued in that supportive position in the editing phase, unless there was a long hiatus between story composition and editing, or if the earlier helper was not available when editing commenced.

The student editing phase has an organization which is best understood through a formulation of the rights and responsibilities which seemingly define who will do what, when. In formulating social organization in terms of rights and responsibilities I am initiating my analysis in a manner totally familiar to social scientists. I am positing a normative order which explains the regularities of behaviour which can be found in my data. In Weber's terms, I am seeking to produce a "correct causal explanation" (Weber, 1968). For various reasons, arising from the literature in Ethnomethodology (Garfinkel, 1967; Coulter, 1983), I am skeptical of the possibility of such explanatory attempts succeeding. Or, rather, I do not believe that they can succeed in a way which meets the canons of rigor for deductive explanation (see Wilson, 1970). On the other hand, for various uncirculated reasons, I no longer believe that Ethnomethodology's recommendations for understanding the nature of rule use in daily life are, in themselves, sufficient to the task of formulating social organization (3).

Rights and responsibilities are certain kinds of rules. A cursory examination of the philosophical literature on rules, and a little reflection, brings out the variety of things rules can be. As "prescribed guides for conduct" (Garver, 1967), rules can constitute activities (rules of chess), they can permit activities (freedom of speech), they can make some actions obligatory (honoring thy father and mother), or they can prohibit some actions (parking). If we depend on the approach to rules found in philosophical discussions, where rules are conceptualized and considered in relation to individual actors, rights and responsibilities can be identified as permission and obligation type rules.

One of the critiques of the use of rules in explaining (and

simulating) human action is that we can never be sure that we have captured an actor's self-understanding when we ascribe rule use to her or him. The best that we can do is to formulate a set of rules which is in accord with the actor's actions, but without guarantee that the actor actually was guided by these, or any, rules when he or she acted (4) (Coulter, 1983, chapter 3).

My intention in what follows is to offer an account of the organization of student rights and responsibilities which is in accord with the way students behave. My account seeks to capture the regularities of student actions. I will write as if my formulations are not only in accord with student actions, but also capture students' self-understandings of, and orientation to, the rules so stated. After the presentation of my formulation I will begin making the case for treating the formulations as a culturally possible way in which collaborative computer editing can be organized, in part. By "culturally possible way" I mean a way that parties to the task can understand each other to be carrying out their actions. This is not the same as claiming that each actor was guided by (my formulation of) rights and responsibilities. It is the same as the claim that the hearer/witness can use the action as grounds for believing that the speaker/actor is oriented to the rights and responsibilities (as I have formulated them).

The following formulation represents only one of a number of possible ways in which collaborative computer editing can be organized. The formulation is based primarily on the interactions of two students, who we shall meet later. The formulation is intended to hold under a certain condition. When the writer (and possibly the helper as well) return from having the teacher correct the hard copy of the writer's story, the writer seats her or himself at the computer. The helper sits in a chair to the left of the computer, in front of the printer. Under the condition that the hard copy is in the possession of the helper (which is usually, but not always the case), the following rights and responsibilities can be understood as in accord with student actions:

Figure 1

RIGHTS AND RESPONSIBILITIES

<u>Activities</u>	<u>Collaborators</u>	
	WRITER	HELPER
Correction	assertable rt,	delegated rt
Interpreting	ultimate respn	and respn
Inputting	rt, delegated respn	no rt, ultimate respn
Arranging	rt, delegated respn	suffrance, ultimate respn

Our focus shall be at the third level of this rule system, but a few words need to be said about the other two levels. And a point of specification needs to be added. It would be possible to formulate

other rules which would be in accord with student actions. The ones which I have formulated here appertain to the "materials" upon which the task of editing depend. These are the corrected hard copy and the computer (keyboard). The issue of control of these materials seems central to the organization of collaboration.

At level one, where the helper has possession of the corrected hard copy, the helper has both the right and responsibility to interpret the teacher's corrections. Initially on logical grounds, I say these are delegated from the writer. Having been (minimally) a "witnessing participant" during the Teacher Correction phase of editing, the writer has ultimate responsibility for interpreting the teacher's corrections. At any time, though, he or she can assert the right to examine and interpret the corrected hard copy.

At level two it is the writer's right to input characters into the Screen Document. While the helper is in possession of the hard copy, the helper can claim no degree of right to input. The direction of delegated and ultimate responsibility (5) has been reversed at this level. As the helper has control of the hard copy, he or she has the ultimate responsibility for what appears on the screen as a result of the writer's compliance with her or his directives. This follows from an organizational feature which follows from the condition under which the rules in Figure 1 hold: the helper tells the writer what to input while they are engaged in Story Correction. Hence, I say that the writer's responsibility for inputting is "delegated," by the helper.

When the students are engaged in Story Repair, i.e., when in the course of Story Correction the screen document has been altered in some way which needs to be "repaired" (cf. Schegloff, Jefferson and Sacks, 1977), the helper still is without inputting rights. However, the relation of ultimate and delegated responsibility is altered. The helper can have "acquired responsibility" if the writer asks questions about what characters are supposed to be on the screen. The helper can be said to have "asserted responsibility" if he or she volunteers information about what ought to be on the screen. In the absence of such actions, it is the writer's responsibility to determine what ought to be input.

We now arrive at the level of our concern, number three. Here the direction of responsibilities for arranging is the same as at level two, and for the same reason. The helper is the one with control of the hard copy, and thus is the one giving directions as to what needs to be done through the use of executive keys. The helper has ultimate responsibility for screen states resulting from the writer's complying with the helper's directions. The writer, in following these directions, is the recipient of "delegated responsibility."

Level three rights are the most interesting. The writer has the right to arrange. During Story Correction and Story Repair segments of editing. This is a bold right. It is not simply delegated from the helper. The helper, too, has a right to arrange. It is a lesser right, which I am here calling a suffrance. The latter is something of an archaic usage, but is to be understood just as it can be found in dictionaries. A suffrance is a tacit permission or tolerance implied by absence of objection. Under certain conditions, where the writer does not object, the helper can assert the right to arrange. The possibility that the writer may object is a source of tension which collaborators must manage if they are to complete the task and remain on good terms with each other. Both are concerns to student collaborators. How they manage this tension also requires inquiry if we are to understand how collaborative computer editing can be

socially organized.

VALUE DIMENSIONS

A difference in value, or emphasis, exists between level one and the two levels concerned with keyboarding and screen states. Level one's value is primarily instrumental. The helper's being engaged in interpreting hard copy corrections is just a way of getting the task of editing done. One could imagine another organization, where the writer would possess the corrected hardcopy, and would tell the helper what correction was. Then the helper would use her or his expertise to achieve on the screen a facsimile of the corrected hard copy.

The (primarily) instrumental value of the helper possessing the hard copy is suggested by the fact that the writer has the assertable right to consult the hard copy, and possess it, if he or she so wishes. There is a moral value dimension, however. If the writer repeatedly takes control of the hard copy, we could expect that to have moral consequences: the helper would be formulated as somehow not fully competent to carry out her or his responsibilities.

The primary value dimension of the distribution of rights and responsibilities on levels two and three is moral. While the distribution has instrumental value, the distribution is instrumentally arbitrary. From a strictly instrumental point of view, arranging ought to be the bold right of the helper, who supposedly is more technically adept at wordprocessing than the writer. However, independent of issues of utilitarian efficacy, students have keyboarding rights and responsibilities which they guard and value. If those rights and responsibilities are violated, the consequences are seen in a moral rather than instrumental light. A moral light is one where the issue is fairness rather than efficacy. Collaborative computer editing has both instrumental and moral value dimensions.

PREFERENCE ORGANIZATION OF ARRANGING

Taken individually, the rights and responsibilities of the writer and helper inform us, and possibly them, as to what each can or must do when an apparent opportunity arises for an arranging move. However, the above formulation does not inform us, or them, as to how they are to satisfy the rules relevant to each of them, given that the other person has some degree of right and responsibility also. There must be a solution to the problem of coordinating potentially competing, rule-relevant actions. I propose that the relation between helper and writer rights and responsibilities for arranging be seen as an organization of preference (see Schegloff, Jefferson and Sacks, 1977; Heap, 1983).

Before formulating the organization of preference, it will be useful to introduce features necessary to any set of rules relevant to interaction.

The distribution of rights and responsibilities as I have formulated them is a system of rules relevant to the actions of two persons (6). As a system, a set of related rules, the distribution of rights and responsibilities are, and must be, mutually established and known. Each person must know (7) their own rights and responsibilities, as well as those their collaborator is likely to assert. And each person expects the other to know and respect her or his rights and responsibilities. And each expects that the other expects her or him to know and respect the other person's rights and responsibilities. These conditions are necessary for the smooth

functioning of an interactional system of rules.

As a feature of the system of rules for editing, and not as a feature of student personalities or dispositions, there is a preference for writer over helper arranging. When one person has a stronger right than another to do the same thing, we can say that the two persons (should) operate with a preference for the person with the stronger right to execute the action in question. If participants do not orient to and enforce this preference, then, in effect, they do not recognize the system of rights which gives rise to the preference. And, without such a system, no party can claim to have a stronger right than any other.

In the case of arranging during collaborative computer editing, there should be a preference for writer over helper arranging. The writer has the right to arrange, while the helper has only a suffrance to arrange.

The question which will now concern us is how the preference for writer arranging is organized over the course of apparent opportunities for engaging in arranging moves. Since a rule, in Hart's phrase, does not "step forth to claim its own instances" (Hart, 1961), how is collaborative computer editing organized such that both writer and helper do arranging under apparent sway of the preference system in question? Of course, both must have the opportunity to arrange, otherwise we would not be able to claim, on the basis of the data at hand, that both have some degree of right to arrange. Data with arranging opportunities, but without evidence of helper arranging attempts, would make it very hard to argue that the helper had a right at all.

I will attempt to characterize the discourse action machinery which provides for the writer rather than the helper doing arranging. And I will characterize the functioning of that machinery, which provides the helper with tacit permission to do arranging. Having some appreciation of these formal possibilities for realizing (in the sense of making real) the system of rules in Figure 1, we will turn to cases of interaction which exemplify the organization of preference and the management of the tensions interior to it.

PART IV

DISCOURSE-ACTION MACHINERY

The rule system for arranging, which establishes the preference for writer arranging, gets realized (made real/visible) through a (soft) machinery for discourse and action (8) during collaborative computer editing. This machinery bears a close relation to that formulated by Sacks, Schegloff and Jefferson with regard to naturally occurring conversation (Sacks, Schegloff and Jefferson, 1974). Formulating the similarities and differences would entail a long discussion. Here some basic differences can be formulated.

The discourse-action machinery is task oriented, whereas conversation machinery is relatively task independent, which allows it to be of use for a wide variety of tasks. Those tasks, however, are accomplished through, in and as talk. The actions accomplished in conversation are primarily speech acts (see Searle, 1969). The actions accomplished through the discourse-action machinery of collaborative computer editing include speech acts. But those acts are primarily devices for fostering the accomplishment of non-verbal acts, e.g., inputting, arranging, getting help from peers or the teacher, etc.

In light of this difference in what the machineries have a design to handle, the difference in turn construction design is not surprising. It is instructive to read Sacks and associates regarding the design of turns at talk in conversation:

Turns display gross organizational features that reflect their occurrence in a series. They regularly have a three-part structure: one which addresses the relation of a turn to a prior, one involved with what is occupying the turn, and one which addresses the relation of the turn to a succeeding one. (1974: p. 722)

Turns at talk during student editing have some of these "orientational" features. Also, there are turns which have all three features, but editing could not get done if all turns were like this. The turns conducive to the accomplishment of screen document reformation need not be oriented to a prior turn at talk, nor to a next turn at talk. Instead, they will be oriented to the consequences on the screen of a prior action turn, of inputting or arranging. And they will be oriented to a succeeding action turn.

The type of arranging-relevant structure I have been alluding to is a discourse-action sequence. This sequence has most of the properties of sequences found in conversation, governed as what conversation analysts call "adjacency pairs" (Sacks, Schegloff and Jefferson, 1974). The proffering of a "first pair part," e.g., a question, makes relevant and required a "second pair part," e.g., an answer, produced by a second speaker (see Schegloff and Sacks, 1974). Such sequences of questions and answers are to be found in our transcripts of editing sessions, but they are ancillary to the primary sequence used in student editing. I call this the "directive-compliance" sequence (10). One student, typically the helper, issues a directive, e.g., "Put a period." The second student (typically the writer) is required to comply by engaging in an inputting action, e.g., hitting the "period" key.

The difference between conversational adjacency sequences and the primary editing adjacency sequences is that the former makes relevant and required a turn at talk, while the latter makes relevant and required a turn at action. It appears that most of the ways in which conversational adjacency sequences can be expanded, e.g., through "side sequences" (Jefferson, 1972), can be used as ways to expand directive-compliance sequences. Such expansion devices are done as turns at talk, but in the case of directive-compliance sequences, their required end, their goal, is an action rather than a turn at talk.

With directive-compliance sequences the helper and writer have a discourse-action machinery for connecting the Correction Interpreting phase of editing with the Screen Document Reformation phase. In solo editing, obviously, there is no need of discourse in order to link acts of correction interpreting to keyboarding moves.

ARRANGING AND THE FUNCTIONING OF THE MACHINERY

The inputting and arranging rights of the writer are satisfied by the writer's participation in directive-compliance sequences: the writer does the inputting and arranging. The ultimate responsibility of the helper and the delegated responsibility of the writer are realized and affirmed through their respective speech act (directive) and keyboard act (compliance). The functioning, then, of the

discourse-action machinery provides for, and satisfies, the preference for writer over helper arranging.

The same machinery that functions to support the preference for writer arranging provides for the possibility of the helper engaging in arranging moves. Logically, if the writer is unable to comply with an arranging directive, then the person who issued the directive, the helper, may have the opportunity to strike an executive key. As well, if the writer's effort to comply with either an inputting or arranging directive somehow misfires, there is an apparent opportunity for helper arranging acts. In the case of inputting mistakes, the delete key (an executive key) can be used to repair the screen state. However, given that the writer, in making an inputting mistake, has not shown her or himself incompetent at arranging, we would expect that the preference for writer arranging moves would still hold. It would be the writer who would hit the delete key. When the writer makes a mistake (miskey) in arranging, then we would expect an opportunity for the helper to engage in arranging moves.

A second way in which the functioning of the discourse-action machinery provides opportunities for helper arranging is related to, but not solely tied to, failed keyboard efforts in directive-compliance sequences. After keyboard compliance moves and screen state repair moves there sometimes occur "singletons."

Singleton turn structure regularly varies depending on whether it is produced as a writer or helper turn at talk. All singletons display an orientation to the prior action turn. Singletons produced by writers (in our data) carry no orientation to a next turn (at talk or action) (9). Singletons produced by helpers do seem to have next-turn implications. The following are examples of singletons produced by writers, with the last two being helper singletons. (Colons are used to represent elongated soundings of utterance portions.)

Whew!
Oh:: I'll kill myself!
Yeah, fine.
Now I know what I'm doing.
Thank you God. I love you.
Okay, I'm doing fine. Ah, um.
I hate this.
And, I'm brilliant!
I'm gonna kill you.
You stupid!

What makes these structures of interest is that they occur after keyboard acts and can be heard as reactions to the effects of those acts. Writer singletons do not make relevant, nor do they require, a next turn at talk or action. This does not mean, however, that the helper cannot topicalize the singleton and produce a turn at talk in the space adjacent to the production of the singleton. For example, in our data after the writer says "And, I'm brilliant," the helper says "No your not," and the writer comes back with "I know."

If singletons are hearable as reactions to screen state changes, they usually occur after the writer's attempt to comply (10) with a helper directive. They may also occur after a writer keyboard act which was not done in compliance to a helper directive. Such keyboard acts can be initiated by the writer in an effort to repair an unacceptable screen state which a prior compliance move had produced. Either the writer or the helper may produce a singleton at this point.

Helper singletons differ from writer singletons in one structural

and one functional way. Structurally, helper singletons usually are hearable as evaluations of writer performance. Particularly if they are negative evaluations, they are treated as in need of response. The softly put "I m gonna kill you," gets as a response by the writer: "I hate your gub:its." Such responses are not always rejections of the evaluation: "You stupid!," uttered by a helper, gets "I'm so stupid. Roy!"

There is one functional difference between helper and writer singletons. A feature of most singletons is that the hearer can make a judgment about whether the speaker is pleased or dismayed with the screen state change to which the singleton is hearably a reaction. Many are hearably positive, e.g., "Okay, I'm doing fine," but others are hearably negative, e.g., "Oh:: I'll kill myself." The negative reactions are particularly salient to the organization of preference. The relevant functional difference between helper and writer singletons is that helper singletons do not work, by themselves, to lift the preference for writer arranging.

A hypothesis to be pursued is that negative singletons produced by writers, in response to their own arranging moves, can be treated by helpers as lifting the preference for writer over helper arranging moves. If the person who has the strong right to do something fails at it and makes visible that failure (e.g., via a negative singleton), then the person with the weaker right can treat the admission of failure as tacit permission to take a turn at arranging. If this occurs, the weaker right can be called a suffrance (11).

Thus it can be argued that the directive-compliance sequence supports the preference for writer arranging acts, and also lifts that preference when the screen state outcomes of such sequences are regarded as untoward and marked by negative (writer) singletons.

PART V

STATUS OF RULES, ONCE MORE

I have laid out a system of editing rights and responsibilities wherein I have claimed there exists an organization of preference. The discourse-action machinery has been described whose structures and functions realize the preference organization for writer arranging over helper arranging moves. This organization includes methods for the lifting of preference, such that the helper can be said to have suffrance to engage in arranging acts. The claims regarding rights, responsibilities and preference have one feature in common. Or, rather, I believe that they have at least this feature in common. All these formulations of normative order are offered as being in accord with the actions of students. My claims, so far as I know, are not incompatible with the actions of collaborators during computer editing sessions we have videotaped. In particular, they are not incompatible with the actions of one set of collaborators, whose actions will be the subject of some scrutiny, below.

The toughest task is to support the claim that the rules which I ascribe to the actors in question are indeed rules to which they are oriented in the course of their activities as collaborative computer users. I see no way that this task can be completed satisfactorily. All attempts to characterize actors' mental states (including their orientation to normative order) are interpretations based on behavioural displays, or their artifacts. The relation of such displays and artifacts to mental states is, at best, one of "necessary evidence" (Wittgenstein, 1958; Heap, 1980a). Under proper

circumstances, one can use what persons do, and the results of such doings, as evidence which necessarily supports the claim that persons were in such and such mental state (12). But the kicker is that the evidence does not entail the presence or existence of that for which it is evidence.

The well-known example of the necessary evidence relation is pain behaviour. Simply, when someone displays pain behaviour, under proper circumstances we can, indeed must, say that the person is in pain. However, we can be mistaken. The behaviour could have been faked, perhaps by a professional actor or a devious acquaintance.

So it is with the behavioural displays of students whom I have videotaped. Those displays allow me, and anyone else who is competent in the ways of North American anglo-saxon/celtic culture, to make claims about the mental states of students, e.g., what rules they are following. But those claims cannot meet the canons of rigour of description for deductive explanation. They are defeasible descriptions (see Heap, 1980b). They can turn out to be wrong, to have been wrong. In the terms of Western Philosophy, we are up against the problem of access to Other Minds.

While the toughest task looks impossible to master, there is a task which, while being tough, at least looks like it can be handled. I want to take the limit of access to Other Minds and turn it into a resource for success. While behavioural displays do not guarantee access to the mental states of actors, they are all that actors themselves have to go on. While we do not know for certain that the writer was oriented to a right to arrange during an editing session, we can be certain that the helper could take the writer's arranging move as grounds for believing that the writer believed that she had a right to arrange.

It is only for scientific purposes of literal description that "necessary evidence" is insufficient. For the practical purposes of ordinary persons engaged in interaction, "necessary evidence," e.g., a certain type of act, is all that is needed, and all that can be had, for making assumptions and judgments about what other persons think they are doing and what guides them in their actions.

What this means is that while we cannot be certain as to what Self is doing/thinking/believing, we can be certain about what Other has a right to believe about Self's mental states. We may not be certain that Self is in pain when he pulls his hand from the stove and sticks it under running water. But we can be certain that any Other observing him has grounds for believing that Self is in pain. And these remain as good grounds for judgment even if we later find out that the behaviour was a deception perpetrated by a practical joker, or a zealous philosopher.

What I want to claim is that while the rights, responsibilities and preference which I have formulated may not be those which guide the actions of writers and helpers, they do form a normative order which each participant, at some point, would have grounds for believing the other participant is oriented to. If this claim can be supported, then I will have established that the early parts of this essay describe a culturally possible way of organizing collaborative computer editing.

In what follows I shall present some cases of interaction which bear upon my claims about the existence, nature and operation of an organization of preference for writer over helper arranging.

PART VI

EVIDENCE OF PREFERENCE

The cases we shall examine are from a 37 minute collaborative computer editing session which occurred just after recess on the afternoon of 27 May 1986. The writer is Joan, who is repeating second grade (see Appendix B). The helper is Mary, who repeated first grade (see Appendix C). Both are repeating second grade. Joan's 17 line story, titled "Miami Vice," has been corrected by the teacher and 35 errors have been marked. Other (minor) errors were not corrected. In the teacher's written profile of Joan she commented that Joan is "extremely careless in her written work" (13). However, Joan is well motivated in activities of her choosing, and collaborative computer writing is an activity which she enjoys.

CASE 1

Joan and Mary had a great deal of initial trouble carrying out the first screen state reformation (correction of the document on the screen). In the course of doing it they deleted and/or erased (14) portions of the document which they had intended to "cursor-through" to get to the end of the line, where a period needed to be placed. The first line of the story as it appeared when the story was called up on the computer at the beginning of the editing session:

Last week I went to the C.N Tower

The time displayed on our videotape when the editing session starts is 6:30.0: six minutes, thirty seconds (15). (The C.N. Tower is a communications spear reputed to be the world's tallest free-standing structure. The 'l' was an uncorrected error.)

As a result of various "miskeys," by 30 seconds into minute 8 the 's' and the 't' of "Last" have been deleted and are being replaced. In the course of these adventures the writer has deleted a space. The first line looks like the second line, below. (The first line, below, represents the number of each columnar space on the screen, with the asterisk representing the placement of the cursor. We do not place the cursor on the document line because of difficulties this poses for reading. For computer users, the flashing cursor, of course, occupies a space on a screen line, often overlapping a character.)

1234*67890

Lastweek I went to the C.N Tower

At the point at which this screen state is displayed Joan turns to her left, looking at Mary, while extending her hand and index finger to point to the screen. Her nose is crinkled up and she has a crooked smile as she uses a self-conscious question intonation: "Oh, what?"

In response, at minute 8:37, as Joan pulls her hand back from the screen, Mary reaches out, saying "You have to put a space," and touches the space bar. Joan ponders, briefly, then hits the space bar. The space bar overtypes the 'w' with a space and moves the cursor one column to the right. The resulting screen state:

12345*7890

Last eek I went to the C.N Tower

Joan reacts to this screen state with "I hate your guts," which, while appearing harsh in print, is not said harshly.

Analysis of Case 1

The point of importance here is one which literally was not visible to well-trained viewers of this videotape, including myself. On early viewings of this section of the tape it appeared that Mary actually hit the space bar. It was not until the tape was played in slow motion, in "frame advance" mode, using a videorecorder employed in the analysis of sporting events (Panasonic NV-8950), that it became clear and visible that Mary only touched the space bar, while it was Joan who (quickly) hit it. The overhead camera shows Mary's hand on the keyboard, but the side-angle camera shot reveals that her hand touches the key without depressing it (minute 8:37.2).

The point is that Mary only touched the space bar, while she could have struck it. Her touching can be viewed as a "showing" to Joan of what needed to be done. We cannot get inside Mary's mind to learn whether she understood herself to be oriented to Joan's right to arrange. However, touching the space bar while uttering "You have to put a space" could count as Mary displaying an orientation to the preference in question. It could count as such a display for us, the observers. It also could count this way for Joan. Given Mary's behaviour, Joan would have grounds to believe that Mary was oriented to the preference for writer arranging.

CASE 2

The second case we shall consider happens around the 11 minute mark on the tape, four and one half minutes into the editing session. The children are still working to repair the screen document's first story line. Minor disasters have produced this screen state:

1234567*90

Lastw .k l went to the C.N Tower

Joan asks Mary what the hard copy says and at minute 10:48 Mary says "w e e k". Joan makes an arranging move to delete the period in column 7. By doing so she also deletes the space which the period occupied. She then presses the "insert key" to insert a (blank) space in its place. With a question intonation Joan says "w?", then follows it with a softly uttered "okay." It sounds as if Joan is orienting herself to the screen display in relation to what needs to be input: the 'w' is supposed to be there and it already is. Mary seems to hear Joan in the same way and at minute 10:58 offers a "reminder" which functions like a directive: "e e". At minute 10:59 Joan complies by hitting the 'e' key with her right hand. The following screen state is produced:

1234567*90

Lastw e k l went to the C.N. Tower

Instead of hitting the 'e' key a second time Joan begins moving her hand to the right on the keyboard, arriving at the right side at minute 11:02. One and a half seconds later Mary exclaims "I'm gonna kill you. Wait". Four tenths of a second after the word "kill" is uttered Joan begins moving her right hand left on the keyboard. She rotates her arm at the elbow as she moves left, such that her arm becomes almost parallel to the rows on the keyboard. She reaches the middle of the keyboard, holds that position for three tenths of a second, then begins to move her hand back to the right. Still holding her arm in a parallel attitude, she makes it to the right side, with

her left small finger touching the top row of keys, and each next finger on the next row down of keys.

Shortly after Joan's hand arrives at the right side of the keyboard Mary's hand can be seen to "snake up" under Joan's, at minute 11:05.3. Mary's hand continues to advance for two tenths of a second, while Joan brings her own right hand down two rows of keys. Over the next two tenths of a second, commencing at minute 11:05.6, Joan grabs Mary's hand and pushes it back toward Mary. No hands are visible on the keyboard (from the perspective of the overhead camera) for two tenths of a second. At minute 11:06.0 Joan commences to utter "I got it. I got it." Upon completion of the utterance Joan moves her hand toward the middle left of the keyboard. At minute 11:06.6 the second finger of her right hand is at the 'e' key. She holds it there for six tenths of a second before pressing the 'e' key at minute 11:07.2. The following screen state results:

12345678*0

Last week I went to the C.N Tower

Analysis of Case 2

What is of interest about the details of this 18.6 seconds of interaction? At least eleven things. Let us take them in serial order, seeing how they can be understood from a situated perspective.

1) At the beginning of this segment (10:48.6) Mary proffers what sounds like a "reminder" that does the work of a directive: "e e". If it is a reminder, then it is a reminder of what Mary's answer was to Joan's query as to what the hard copy said. The case for it also having a directive function, intended by Mary and heard by Joan, is not strong, at this point.

2) Joan's subsequent action, hitting the 'e' key can be interpreted as a compliance with a directive, or as further evidence that we have here a structural relative of a directive-compliance sequence. In that Joan is just carrying out the line of action she sought help for earlier, she can be interpreted as not complying with a directive but just acting on information available to her.

3) Instead of "complying with a directive" or "acting on information available to her" Joan, at 11:02, can be seen as "doing something else." She has moved her hand away from the 'e' key to the right side of the keyboard. If hitting the 'e' key the first time was "compliance," then not appearing to intend to hit it a second time is "non-compliance with a directive."

4) Mary's utterance, at 11:03.5, "I'm gonna kill you. Wait." gives hearers, including Joan, the right to believe that Mary is upset with the apparent intent of Joan to do "something else." The "Wait" is a directive not to do what can be done at the right side of the keyboard: strike an executive key, to delete or insert. Mary can be heard as admonishing Joan for considering an arranging move when an inputting move is relevant. That she would be so concerned suggests that Mary may, indeed, have intended her earlier "e e" to be a directive, and not just a reminder of what needed to be input.

5) As Mary says "Wait" Joan appears to initiate a compliance move, by moving her hand away from the right to the left portion of the keyboard. Notice, though, that this is not an act of apparent compliance with the directive "Wait." Instead, it is the visible initiation of compliance with the earlier "directive": "e e".

6) At 11:05.0 Joan ceases her "visible initiation of compliance" by moving her hand back towards the right side of the keyboard, where the executive, arranging, keys live.

7) When Joan's hand arrives at the right side of the keyboard, it is in an odd attitude. She has been holding her hand parallel to the rows of the keyboard and now has her fingers draped over the four rows of the keyboard (not counting the space bar as a row). Specifically, her hand and fingers are not "visibly poised" to do keyboarding. She's only in the region where such work can be done.

8) An interpretation: A) in the absence of "visible initiation of compliance," B) in the presence of Joan's hand in a region where non-compliance is projected, but where C) Joan is not "visibly poised" to arrange or input. Mary treats the preference for writer arranging (and hold right to input) as having been lifted, as no longer binding. Mary's "directive," to which Joan has displayed orientation to as a directive (point 5), has not received compliance. It does not look like it will be complied with. And it doesn't look as if the writer has some definite idea as to what she wants to do. Why Mary wants to do an arranging move here, and which move she wants to do, are opaque to me. Perhaps her intent is to delete the 'e' which has been input and to move the cursor to the left to the point where the two 'e's could be input next to the 'w'. I do not know. The important point here: Joan's actions give Mary grounds for claiming her suffrance for initiating an arranging move.

9) Joan objects to Mary's move. In grabbing her hand and pushing it away at 11:05.6, Joan's behaviour gives us our second important point: Joan can be interpreted (by Mary and by us) as asserting her right to control the keyboard. If Joan wishes to do "something else," which can be done with an executive key, that is her right. Or, at least that is the right Mary and the rest of us can interpret Joan as asserting.

10) After Joan pushes Mary's hand away she does not engage in an arranging act. She could have done so. Her hand had been in that area. Instead of arranging, she utters "I got it. I got it." How are we to hear this, and, thus, how could Mary have heard it? Joan doesn't seem to be crowing about having got Mary's hand. What has she got? She's got what to do, or, at least she is emphatic in making a claim which Mary can treat as (necessary) evidence that Joan believes she knows what to do. Perhaps, interactionally, such a turn construction as "I got it. I got it." could forestall action from an untrustworthy interlocutor who might re-assert her suffrance to engage in arranging.

11) Joan finds the 'e' key and is "visibly poised" to strike it. Joan's six tenths of a second "pause" allows Mary to see what it is that Joan has "got," while giving Joan time to reflect as to whether this is the move she really wants to make. At minute 11:07.2 she makes it, and in so doing produces the compliance move which satisfies the directive discussed as point one, above.

Close attention to a third of a minute's interaction has revealed the complicated, inter-nested structure generated by the discourse-action machinery of collaborative computer editing. That machinery is built to handle directive-compliance sequences. We have seen that when such sequences look as if they will not be completed with a compliance move the helper can be interpreted (by the writer and by us) as treating the preference for writer arranging as having been "lifted." And we have seen the subsequent actions of the writer establish for the helper (and for us) grounds for believing that the writer holds a preference for arranging. Or, at least, holds a preference to control the keyboard and not allow the helper to assert her suffrance to arrange. The negation of the helper's suffrance obversely supports the preference for writer arranging.

LIFTING PREFERENCE

Having established that both the writer (in case 1) and the helper (in case 2) had grounds to believe that their fellow collaborator was oriented to a system of preference for writer arranging, I want to turn to a case which shares one of the important features of case 2: grounds for believing that the preference in question has been lifted.

Case 3

This segment of editing begins around the nine minute fifteen second mark on our videotape, under three minutes into the student editing session. The segment ends around the nine minute thirty eight second mark. It is organized with a directive at its "head" (cf. Sinclair and Coulthard, 1975). It concludes with a "feedback-acknowledgement" sequence.

The screen state at the initiation of this segment is as follows:

1234*67890

Last week I went to the C.N Tower

The screen state just prior to this one had a 'w' in the fifth column and one extra space to the right of the 'w'. At the direction of Mary, Joan pressed the delete key, thereby ridding herself of the 'w' and the space which it occupied, giving us the above screen state.

The segment begins with Mary pointing at the screen as she issues the directive: "Okay, now, put the cursor right there" (16). Instead of a compliance move in the next turn slot we find Joan initiating a side sequence (Jefferson, 1972) aimed at getting help to carry out the directive. Joan says "Cursor. How the heck do I do this? Control". She then touches what looks like the control key. In the response slot of the side sequence Mary issues what is hearable as a negative reply to the idea that the control key should be used: "Mm! Mmm: mm".

Joan then reissues her side sequence question: "How the heck do I do ~~aw~~ that?" Without waiting for a reply, and without any sign from Mary that she is about to produce a response to Joan's second attempt to secure help, Joan presses the delete key twice. The following screen state is displayed:

12*4567890

La week I went to the C.N Tower

Just as Joan initiates her arranging/deleting moves Mary gasps. And just as the cursor comes to rest in the third column Mary points at the screen and initiates a question which she "cuts off" at its completion: "Did you get/?". Mary withdraws her gaze from the screen, covers her face with her right hand, and closes her eyes, with her head facing between Joan and the screen.

In apparent response to the screen state she has produced, Joan utters: "I hate my guts." As Joan issues this singleton Mary's eyes open and she peers at the keyboard through her upheld hand. Mary's hand then comes down onto the keyboard terrain over the space bar and lights on the insert key at the right edge of the keyboard. Joan's right hand is at the right edge of the keyboard. Both Joan and Mary are looking at Mary's hand at minute 9:32.0. Their eyes blink in unison at 9:32.1 and in the next two tenths of a second they

simultaneously turn their heads toward the computer monitor's screen. They hold this position for a full second, with their eyes on the screen and Mary's finger on the insert key. Mary depresses the insert key at 9:33.2. The resulting screen state is as follows:

12*4567890
La eek I went to C.N Tower

Mary then says: "Yeah. You're doing fine!". With traces of disbelief Joan utters an acknowledgement "Ah-huh." Mary then launches into another directive sequence, concerned with inputting an 's' and a 't'.

Analysis of Case 3

What is the discourse-action structure of this segment? We have eleven moves. In Figure 2 the moves are diagramed. M and J stand for Mary and Joan. A colon represents a speaking turn. A dash represents an action turn. The left side sketches what was said or done by Mary or Joan. The right side formulates discourse/action functions. The indentations represent moves which are related to, but do not directly address the topic or task made relevant by the prior move. Indentations at the same level represent directly related moves.

Figure 2

1	M:	"put the cursor...here"	:	Directive
2	J:	"how?...Control"	:	Question
3	M:	"Mm! Mmm: mm"	:	Response/Evaluation
4	J:	"how do I do aw that?"	:	Question (Reissue)
5	J-	(presses delete key twice)	-	Arranging Action
6	N:	(gasp)	:	Reaction/Evaluation
7	M:	"Did you get/?"	:	Question
8	J:	"I hate my guts."	:	Negative Singleton
9	M-	(presses insert-space key)	-	Arranging Action
10	M:	"You're doing fine!"	:	Feedback
11	J:	"Ah-huh"	:	Acknowledgement

First, two notes of clarification. The figure represents moves, which are a smaller unit than turns (Sinclair and Coulthard, 1975), though that is a relevant point only in regards to some of the above moves. In particular, moves 6 and 7 occur within one turn. The second note is really a warning: Figure 2 is composed of move descriptors which are roughly drawn and have different levels of application. Directive, Response, Reaction, Evaluation, Feedback, and possibly Acknowledgement are all rather more general, generic categories than Question. This mixing of levels of description may do no harm here, but it does need some sorting out. However, I am less concerned with the purity and elegance of move descriptors than I am with what can be shown through drawing attention to the referents of these descriptors.

Consider the above structure. At the head is a directive. It does not get a compliance move in the following turn slot. It gets a side sequence of Question-Response/Evaluation. The second move of this side sequence is interesting because it doesn't answer the question, it provides only an evaluation of what Joan proposes as a possible compliance move to the directive of move 1. Mary's negative

"Mm! Mmm: mm" is hearable as an attempt to respond to the question of move 2 while keeping alive the requiredness of Joan orienting to the directive of move 1.

In move 4 Joan reissues the question from move 2. The absence of an answer to move 2 may motivate Joan's not waiting long for a reply to her move 4 reissue of the same question. Joan makes an arranging move, deleting two characters from the screen. As Joan has initiated an action (move 5) without giving Mary an opportunity to reply to the question she posed as move 4, we can understand Mary's reaction in move 6: a gasp.

As Joan has shown herself through her questions to be oriented to directive move 1, Mary has grounds for believing that Joan's arranging move 5 is to be interpreted as an attempt to comply with directive move 1. Frankly, though, it is difficult to see how deleting two characters could be considered as complying with the cursor movement. Mary may have been calling for in directive move 1. Mary, too, seems not to see the appropriateness of move 5: in move 6 she reacts with a gasp and initiates, but does not complete, a question to Joan in move 7.

Move 8 is important. I formulated it earlier as a reaction to the screen state produced by move 5. In Joan's saying "I hate my guts" after Mary's somewhat exasperated, uncompleted question at move 7, Joan can be heard as acknowledging failure, accepting blame for an untoward screen state. It is what I have called a "singleton." It seems oriented to a prior turn (move 5) and does not project any next action or discourse turn. No particular next move is made relevant and required by move 8. In that move 8 can be heard to topicalize action move 5, it would seem, though, that a move would be appropriate which was somehow concerned with the state of affairs for which Joan takes responsibility in move 8.

Note the placement of move 8 in relation to the previous moves in the discourse-action sequence. All of Joan's moves (#2, 4, 5 and 8) are oriented to compliance with Mary's directive, move 1. Or, at least Mary has reason to make this interpretation of Joan's moves, including the odd arranging move, #5.

In light of Joan's attempts to comply with Mary's directive, and given the odd character of move 5, Mary has grounds for hearing "I hate my guts" as both a negative self-evaluation of Joan's arranging move and as an audible acknowledgement by Joan of her failure to achieve the state of affairs sought by Mary. Move 8 is hearable as what I have called a "negative singleton."

If Mary takes "I hate my guts" as marking Joan's arranging/compliance move as a failure, Mary has grounds for believing that the preference for writer arranging has been lifted.

Mary's move 9 claims her suffrance to arrange. Or, at least we, and Joan, can interpret Mary's arranging move as an assertion of the helper's right to arrange.

Now note the circumstances which obtain over the course of Mary's move 9. At minute 9:32.0 both Mary and Joan are looking at Mary's hand as it comes to rest on the insert-space key. In what looks like micro-choreography, after blinking in unison within one tenth of a second, Mary and Joan take two tenths of a second to turn towards the screen. Mary stays "visibly poised" to press the key for a complete second, before doing so at minute 9:32.2. The point of significance regarding the social organization of preference is that Joan had one and two tenths seconds to stop Mary from pressing the insert-space key. In the absence of objection from Joan, Mary engaged in arranging.

Recall the definition of suffrance: "absence of objection" is what establishes that one party will tolerate the other party engaging in some act. Joan's absence of objection can be interpreted by Mary as (necessary) evidence that Joan recognizes Mary's right to arrange, this time.

Moves 10 and 11 are analytically interesting for a number of reasons. Instead of Mary saying something like "Good," thereby evaluating her arranging move 9, she says "You're doing fine!" The latter is issued with a real upbeat emphasis on "fine." Mary seems to be jolly-along Joan. Joan's failure is reflexively formulated as not relevant, or as not counting. Move 11 shows Joan to be skeptical as to the truth of Mary's assurance that she is doing fine.

What Mary means in move 10, and what function(s) her utterance serve, are ambiguous, to me, and thus possibly to Joan as well. This ambiguity makes doubly important the move which follows Joan's "Ah-huh." Mary says: "Oh, 's' 't'." She initiates a new directive. In so doing she closes off any remaining sequential relevance of the previous directive, move 1. This new move reflexively makes move 10 and 11 into a closing "feedback-acknowledgement" pair for the directive-compliance sequence we have been examining.

Close attention to another third of a minute of interaction during an extended directive-compliance sequence has revealed the fine synchrony of collaborative computer editing. Within and through the intertwining of turns each participant has made available to the other grounds for believing each subscribes to the normative system of preference for writer arranging.

Based on the placement of the writer's negative singleton, the helper had grounds for believing that the preference was no longer operative. The helper's initiation of an arranging move, coupled with her visibly holding a keyboarding position, provided grounds for the writer to believe that the helper took the preference for writer arranging to be lifted. And the writer's untaken opportunity to object gave the helper grounds to believe that her right to arrange was at least tolerated by the writer.

God knows what anyone actually did believe, but these are the things they had a right to believe. And these are the things that reveal the details of the organization by which preference for writer arranging can be lifted.

CIRCUMSTANCES, MANAGEMENT AND TENSION IN ARRANGING

The fourth and final case includes features discussed in the prior cases, but is worth attention because it reveals the importance of circumstances and interaction management in the turn by turn constitution of collaboration. Also we shall discover a tension within the normative order of rights and responsibilities.

Case 4

The actions of interest occur around the eleven and a half minute mark and within the five seconds beginning at the eleven minute forty five second mark on our videotape. To comprehend the organization of preference as it operates, and is managed, we have to go back nearly to the end of Case 2. Recall that at the 11:07.2 mark Joan hits the second 'e' which Mary earlier had directed her to strike twice.

After the second 'e' is struck Mary changes her mind and directs Joan to "Erase it." Everything to the left of the cursor is deleted, for six spaces, to column one. For some reason, both students express

dismayed surprise at the effects of pressing the delete key. Joan has lifted her hand from the keyboard and brought both her hands to her face. Glossing over an analysis which could be done on how preference is lifted here, we can note that Joan's reaction with her hands is treated by Mary as allowing Mary to take over repair of the screen state situation.

At 11:19.2 Mary begins inserting eleven spaces. After this action is launched, and in the midst of it, Joan asks: "Okay, what am I doing now?" She gets no response from Mary, who continues to hit the insert key for a few more strokes. However, "keylag" is a problem. Mary stops hitting the key, but spaces continue to be inserted on the screen. Mary registers surprise and tells the computer to stop and holds up her hands towards it. She grabs at her face when she sees the resulting screen state. The cursor is in column one with the remainder of the line spread out from column 12 onwards to the right.

Joan then repeats her question: "Okay, what am I doing now?" She looks toward the hard copy in front of Mary. Joan receives no answer, while Mary initiates an arranging attempt. At 11:30.0 Joan grabs Mary's hand and pulls it away from the keys. A tenth of a second later Mary mildly explodes with "Wait! Wait!" This gains Mary suffrage to attempt another set of arranging moves at 11:30.8. She hits the delete key, perhaps trying to delete spaces. But spaces are deleted only to the left of the cursor and the cursor is in column one of row one. The cursor doesn't move. Barely moving her mouth, Joan says "I'll break your fingers girl," but takes no action to stop Mary. Not one to give up, Mary hits the delete key another few times.

Just as Mary hits the deleted key the last time, Joan, looking at the screen utters "Don Don't". The former sounds like an incomplete "Don't." The last consonant is not sounded, perhaps because as Joan utters "Don" Mary has visibly completed her arranging efforts, such that a directive to desist is no longer germane. When Joan issues her directive she initiates no physical move to stop Mary.

Joan's second "Don't" (assuming that "Don" was a token of "Don't") is said softly and is in an overlap position with Mary's "But how?". Mary is puzzled by the lack of effect of hitting the delete key and turns to Joan. Mary has brought her hand up pointing at the screen. Our impression is that Joan's second "Don't" is not a directive to Mary to stop striking the delete key. Mary has stopped hitting that key before Joan finishes "Don." This is highly speculative, but the second "Don't" seems to be a first attempt at the utterance which follows, indeed is latched to, Mary's "But how?". Joan says: "Don't worry. I'll get Peter to do it."

Peter is the ever-present computer expert. Joan's way of getting Peter's attention is to look his way and say "Peter, I'm gonna kill myself." She does not say this very loudly and Peter does not show up at this time.

At minute 11:39, right after Joan calls Peter, Mary points at the screen and again initiates a question to Joan: "How did you move that over here?" I do not know exactly where she was pointing, and do not know when it was that Joan did whatever it is that Mary wants to know about. My conjecture is that Mary is concerned with the problem of moving either the line of document left towards the cursor or is concerned with how to move the cursor over to where the document line begins, at column 12. Either way, her concern looks to be with closing the gap between the cursor and the remaining document line.

Joan asserts control of editing at this point. She does not answer Mary's question. Instead she inputs 'L', then in a series

inputs 'a' 's' 't', completing this inputting effort at 11:43.5. The resulting screen state:

1234*6789012

Last k l went to the C.N Tower

This inputting series was unusual in that it was not done as a compliance move by Joan and it was based on her memory of how the line began.

Slightly over two seconds later, after the 't' has been input, Mary, who has been sitting and looking at the screen says "I think space." She turns her gaze to the keyboard and by 11:46.3 she has initiated an arranging move. Her right hand comes up under Joan's left hand. Joan is standing with her left hand resting on the lower left display keys. As Mary's hand comes onto the left third of the space bar, Joan moves her hand down slightly. While looking out from under her eyebrows at the screen, Joan grabs Mary's hand with her own left hand at 11:46.9. As she does this she utters a terse "No."

Joan pulls Mary's hand back and away from the keyboard and has it firmly in her grip for half a second. At 11:47.6 their hands begin to rotate, possibly turned by Mary. In the next tenth of a second Joan has opened her grip and by 11:47.8 has dropped Mary's hand. Immediately Mary's hand begins turning up toward the keyboard. When her fingers reach the keyboard at 11:48.1 Joan's hand is back on hers, but only touching it, "riding" on the back of the hand, without touching the fingers. Mary says "Wait". In the next tenth of a second Mary has shifted her eyes from the screen to the keyboard and has brought her finger down onto the space bar. Joan's hand continues to ride Mary's as Mary hits the space bar at 11:48.5. The cursor moves one column to the right, producing the following screen state:

12345*789012

Last k l went to the C.N Tower

Mary and Joan pull their hands away from the keyboard. Joan straightens up. Mary breaks into a smile and stands. As she does so, at 11:49.6, Joan says "Oh, good girl, well, we got that right."

Analysis of Case 4

This "long" (40 second) segment of interaction has two instances of the helper attempting an arranging move, then being grabbed by the writer. In both instances the helper says "Wait," reinitiates the arranging attempt and is not stopped by the writer. In the first instance the arranging attempt seems to fail. In the second it is regarded as successful. There are six questions which direct us to structurally interesting features of the social organization of preference.

1) What allows or provides for the initiation of arranging moves by the helper in case 4?

(Transcript segments will be presented prior to discussing the relevant instances of interaction for this and the following four questions. These segments are slightly abbreviated "reminders" of the interaction as described in Case 4. In each segment the 'e' symbol marks the move which is the focus of the question under consideration. A single oblique marks a "cut off" word. Other conventions will be introduced as necessary. To examine the full transcript presented

here, see Appendix B.)

Instance 1

M- ((inserting spaces with insert-space key.))
J: Okay, what am I doing now? ((spoken while M is still inserting spaces.))
M: Okay, sto/ sto/ ((M grabs her face))
J: Okay, what am I doing now? ((looks at hard copy.))
@ M- ((reaches across to keyboard))

In the first instance of helper initiation of an arranging move, around the 11:30 minute mark (O), Mary qua helper can be seen as attempting to repair the screen state which she produced with her eleven inserted spaces. Since she produced that screen state, after directing Joan to "erase" (delete) a portion of the document, Mary can be treated as responsible for the current screen state, with the first character of the line being at the 12th column.

In the first instance, then, initiation of arranging looks to be motivated by Mary's sequentially, publically traceable responsibility for a state of affairs which she apparently regards as unsatisfactory. Asking or, worse, directing Joan to re-arrange the screen state would have been like Mary asking/directing another person to clean up her mistake. Mary's initiation of a keyboard action, then, can be understood as warranted by "special circumstances," i.e., Mary's being responsible for having personally dis-arranged the screen state.

Instance 2 (Left brackets represent overlapped actions. Double obliques represent "latched" turns: no gap and no overlap between turns.)

J: Don [Don't
M: [But how?//
J: //Don't worry, I'll get Peter to do it.
Peter, I'm gonna kill myself.
M: How did you move that over here? ((points to screen))
J- ((presses Shift and 'L'. Then presses 'a', 's', then 't'.))
M: I think space.
@ M- ((reaches to hit the space bar.))

In the second instance of helper initiation of an arranging move, around the 11:46 minute mark (O), Mary's action could be seen as based on public grounds for believing either that Joan does not know what to do next, or that Joan does not know how to do what needs to be done next. Either way, Joan can be formulated as not being able to meet the "direction requirement" (Heap, forthcoming) attendant to task-completion: doing whatever needs to be done next.

Mary would have grounds for holding this belief about Joan for two reasons. First, Joan has not answered Mary's questions about how screen state changes (closing the gap between cursor and characters) could be achieved. Instead, Joan tells Mary not to worry, and calls Peter. Mary reissues the question (assuming it is the same question), but Joan does not answer. Second, the action which Joan takes instead of answering Mary's question is to input "last." The 'a', 's' and 't' are input in a series, with a slight pause as Joan searches for the 't' key. Virtually the same amount of time which it took to input 'a' and 's' lapses before Mary says "I think space." In that amount of time (two seconds) Joan could have taken some keyboard

action. She could have hit the space bar, or moved the cursor with the Shift/Right-angle-bracket key combination. She did not make any keyboard move (17).

In the absence of verbal or physical evidence that Joan knew how to move the cursor (or characters) on the screen, Mary would have had grounds to believe that Joan did not know how to do what was needed next.

Why, though, would Mary initiate an arranging move herself, rather than direct Joan to make some move? The answer, I believe, is to be found in the apparent "change in circumstances" which Joan's actions could have signaled to Mary.

Rather than answering Mary's question, Joan inputs the first word of the story. For the first time in the editing session Joan takes keyboard action while there is no directive "on the floor." This move happens after Joan had twice called for a return to "normal circumstances" by asking Mary "Okay, what am I doing now?" The failure of Mary's arranging moves with the delete key led to the call for Peter (who did not show up). Joan's action of inputting-without-a-directive could be interpreted by Mary in these circumstances as effacing the previous normative order, the one in place and oriented to before Mary initiated her eleven insert-space moves.

Joan's task-orientatedness in inputting "Last" could be taken as opening the door to Mary's participation in the effort to repair the screen state, the very screen state produced by Mary's actions and directive.

While Mary's sense of responsibility in the first instance of attempted arranging constituted the situation as one of "special circumstances," Joan's actions in the second instance could have constituted the situation for Mary as one of "changed circumstances." Both situations could have appeared anomalous with respect to the sense of normative order up to minute 11. And under this interpretation both situations would have provided Mary with grounds for initiating an arranging move, rather than directing Joan to strike executive keys.

2) What are the grounds available to the writer to object to the helper's initiation of arranging?

Instance 1

- J: Okay, what am I doing now? ((spoken while M is still inserting spaces.))
M: Okay, sto/ sto/ ((M puts her hand to her face))
J: Okay, what am I doing now? ((looks at hard copy.))
M- ((reaches across to keyboard))
G J- ((grabs M's hand and pulls it away))

In the first instance Joan has twice displayed a concern with carrying on the editing task in terms of the heretofore typical distribution of rights and responsibilities between writer and helper. In virtue of Mary's control of the hard copy, and her issuing of directives in relation to the corrections to be found therein, Mary has both the right and responsibility to handle the requirement of determining "what's next." Mary's action in the space following the first issuing of Joan's question, "Okay, what am I doing now?", does not answer Joan, but it can be interpreted as "putting on hold" the relevance of the question. After all, the series of space insertions initiated at 11:19.2 begins before, and continues after, Joan issues

her question.

Mary can treat Joan's question as poorly placed, as not deserving or requiring a response until she has completed her series of arranging acts (18). The timing of the discourse turn initiation can be an abiding problem in settings where one person is engaged in some serial action and the other person wants to talk, i.e., wants the person engaged in the action to engage in discourse. It is not so much that serial actions have no "seams" which can be used as "transition relevance places" (Sacks, Schegloff and Jefferson, 1974). Rather, the problem is that the potential talker has no way of deciding what the person doing the serial acts will regard as "enough acts completed" before speaking.

Think here of asking a question as someone is typing at a computer or typewriter. When do you ask your question? How long do you wait? These questions bring into view a variety of issues which may have been lively in the interaction between Joan and Mary, e.g., issues of figuring out what the other is doing in the first place in order to decide when to interrupt, issues of politeness, issues of whether one's right to an answer is stronger than the other person's right to continue doing what he or she can be seen to be doing, etc.

If we assume that the problem on the occasion of the first issue of Joan's question is the above "timing" issue, then we have grounds for appreciating Joan's next action. Mary appears to complete her series of moves. She pulls her hand from the keyboard and grabs her face in apparent frustration with the results of her efforts. Joan then reissues her question, making relevant an answer by Mary. When Mary initiates an arranging move in the slot where an answer should occur, Joan grabs her hand and removes it from the locale of the keyboard.

In the first instance, then, we can understand Joan's action as based on Mary's violation of the conditional relevance (Schegloff and Sacks, 1974) of Joan's question: an answer should have been provided. However, the action Mary took instead of answering the question itself could have been treated by Joan as objectionable. Mary's action was an attempted arranging move.

If there is a preference for writer arranging moves, then the obverse would be dispreference for helper arranging moves when the preference for writer arranging could be maintained. The question is whether the circumstances were appropriate in the first instance for maintaining the preference for writer arranging, and for objecting to Mary's action.

At this point we encounter a possible difference in interpretation between Mary and Joan. I have argued that Mary could be seen as having a sense of responsibility for the dis-arranged screen state. In view of Joan's attempts to reassert "normal" relations and circumstances ("Okay, what am I doing now?"), it would follow that Joan sees nothing special about the circumstances which seem to motivate Mary's arranging efforts. If there is nothing odd or special about the circumstances, about what is relevant to functioning of the normative order of arranging, then Mary's arranging attempt should be foiled.

Hence, Joan's grabbing of Mary's hand can be seen to have been doubly warranted. It was warranted because of Mary's failure to do what was relevant: answer Joan's reissued question. And it was warranted by the dispreference for helper arranging when writer arranging could have been done---assuming "normal circumstances."

Instance 2

- M: How did you move that over here? ((points to screen))
 J: ((presses Shift and 'l'. Then presses 'a', 's', then 'l'.))
 M: I think space.
 M: ((reaches to hit the space bar.))
 @ J: ((grabs M's hand and pulls it away.))

In the second instance of helper initiated arranging Mary's effort follows after her uttering "I think space." Now, Joan may not have known what to do next, after inputting "Last," but she can be interpreted (by Mary and by us) as asserting her right to arrange. The standard interactional format for Mary and Joan has been for Mary to issue a directive rather than to take the action herself. Here, Joan initiates the action herself. While Mary may regard the circumstances as changed, with the previous normative order effaced by Joan's inputting moves, there is no reason why Joan would necessarily see the circumstances as changed by her inputting moves. Joan was just doing what she saw needed to be done, and exercising her inputting rights to do it. Mary's attempted arranging move is a violation of Joan's right to arrange. Joan snatches Mary's hand and says "No."

In both instances Joan's reaction to Mary's arranging attempts can be seen as locally rational vis-a-vis the perceivedly "normal" distribution of discourse and action rights and responsibilities between them.

3) What allows or provides for helper re-initiation of arranging moves, after the writer has objected to the helper's first initiations in case 4?

The answer to this question builds on the answer to the first. In the instances of helper initiation of keyboarding, the writer objects, physically in the first instance, physically and verbally in the second instance. The writer asserts the obverse of the preference for writer arranging: a dispreference for helper arranging. However, the writer's assertion of her rights does nothing to alter those states of affairs which provide grounds for the helper's sense of responsibility to act.

Instance 1

- J: Okay, what am I doing now? ((spoken while M is still inserting spaces.))
 M: Okay, sto/ sto/ ((M puts her hand to her face))
 J: Okay, what am I doing now? ((looks at hard copy.))
 M: ((reaches across to keyboard))
 J: ((grabs M's hand and pulls it away))
 M: Wait! Wait!
 @ M: ((hits delete key twice, no change on screen))

In the first instance, Joan's objection to Mary's move does not make Mary any less responsible for the unsatisfactory screen state produced by her directive and space insertion moves. Interestingly, though, Mary could have desisted at this point, treating Joan's objection as a sign that Joan would solve the problem at hand. However, since Joan had by then twice asked Mary "Okay, what do I do now?", Mary had grounds for believing that Joan did not know what to do next. And if we believe that Mary appeared motivated to repair her

own screen state dis-arrangement, then she would not have desisted and and directed Joan to repair the screen state.

Instance 2

M: How did you move that over here? ((points to screen))
J- ((presses Shift and 'l'. Then presses 'a', 's', then 'l'.))
M: I think space.
M- ((reaches to hit the space bar.))
J- ((grabs M's hand and pulls it away.))
J: No.
M: Wait.
J- ((regains contact with M's hand))
@ M- ((presses the space bar once.))

In the second instance, Joan's objection to Mary's move, in itself, provides no evidence that Joan knows any better what to do next than she did before Mary initiated her arranging move. And recall that an auspice for Mary's initial attempt at arranging was that Joan had not answered Mary's question and had not continued keyboarding after inputting "Last", i.e., Joan showed no evidence of knowing what to do next.

The second instance of re-initiated arranging has another rational feature. Recall that Joan issued a terse "No" in tandem with her physical rejection of Mary's move. How could this "No" have been heard? Was it a no to Mary's arranging move, or a no to her idea of putting a space next? If Mary heard "No" as directed at both her move and her idea, issuing a directive to Joan to hit the space bar would have been redundant and ineffectual. Under this interpretation, Joan had already rejected the option of putting a space.

If a directive would have been rebuffed by Joan, why would Mary have gone ahead and attempted an arranging move? Here I think we, and Joan, would have the right to interpret Mary's move as based on her felt sense of responsibility, as a helper, for the arrangement of screen states during editing. Here is where we could have a tension between the helper's responsibility for arranging and the writer's right to arrange.

Helper re-initiation of arranging was provided for by the same states of affairs which animated the first attempts at arranging. Writer assertion of rights could not be as seen altering the helper's sense of responsibility for doing what needed to be done next.

4) What allows Mary to continue her arranging effort after its reinitiation?

Instance 1

J- ((grabs M's hand and pulls it away))
M: Wait! Wait!
@ M- ((hits delete key twice, no change on screen))
J: I'll break you fingers girl.
M- ((hits delete key perhaps three more times, no change))

In the first instance Mary reacts to her hand being grabbed with "Wait! Wait!". Why Joan relents, I have no idea, except that it is clear that Mary objects to Joan's objection to letting Mary arrange. In the face of this objection Joan relents. During Mary's arranging effort she issues a threat: "I'm gonna break your fingers girl." The

threat is not issued with much menace. It is said rather quietly, with little mouth movement. As she says it Joan looks first toward the front of the class, then off to her right.

One reading of this behaviour is that Joan does not want others to hear her threat to Mary and she is looking around to see who is paying attention to the action at the computer. The issue looks to be moral, although which moral issue it is, I do not know. One could imagine that Joan is displeased not to be in control of editing her own story, but is more concerned with what other people in the class will think of her if they see Mary doing the keyboard work.

In the first instance, then, Joan's objection to Mary's reinitiated arranging move was only verbal. It did not appear to be designed to hamper Mary's arranging efforts.

Instance 2

M: Wait.
J- ((regains contact with M's hand))
@ M- ((presses the space bar once.))

In the second instance, where the space bar is hit after Mary announces "I think space," Mary's effort is monitored, but not hampered. This was done rather neatly. Joan dropped Mary's hand, but as soon as Mary brought her hand back to the keyboard, Joan reestablished contact. The point of contact was behind Mary's fingers. If Mary had attempted to do more than she announced, e.g., sail over to the right side of the board to play "delete" or "insert," Joan could have easily grabbed her hand.

In both instances, what secured Mary's suffrance to arrange was Joan's decision not to intervene.

5) What were the consequences of Mary's arranging moves?

Instance 1

M- ((hits delete key perhaps three more times, no change))
J: Don [Don't
H: [But how?//
J: //Don't worry, I'll get Peter to do it.
@ Peter, I'm gonna kill myself.

In the first instance, where Mary was punching the insert-space key, nothing happened on the screen. This failure of Mary's arranging effort constituted for Joan an occasion for transcending the normal order of interaction during editing by calling for Peter, an outside expert. Thus a consequence of helper failure can be that the function of the helper is transferred to someone else. This could operate as a pressure for helpers to give the appearance of knowing what they are doing, even if they are not sure (19).

Instance 2

- M: I think space.
 M- ((reaches to hit the space bar.))
 J- ((grabs M's hand and pulls it away.))
 J: No.
 M: Wait.
 J- ((regains contact with M's hand))
 M- ((presses the space bar once.))
 M&J- ((pleased responses))
 A J: Oh, good girl, well, we got that right.

The consequences of Mary's second completed arranging move are more revealing. Mary seems independently pleased with the effect she has achieved by hitting the space bar: the cursor is moved one space to the right, thus one space nearer the rest of the first line of the document. Joan is pleased, too. She congratulates Mary: "Oh, good girl..." But note how she constructs the rest of her turn: "well, we got that right." We got that right. She has claimed joint, or at least partial, responsibility for moving the cursor one space to the right! And what could be the basis for her claim? The fact that she allowed Mary to hit the space bar.

Recall in the second instance that Joan tolerated Mary's move only after Mary protested Joan's first objection to Mary's arranging effort (Joan grabbed Mary's hand). Recall further that Joan had grounds for objecting: Mary announced the next move ("I think space") without observing the preference for writer arranging, e.g., she could have issued a directive to Joan. Hence, Mary's arranging move could be seen as a violation of the writer's right to arrange, assuming "normal circumstances."

What we have in Joan's turn construction ("we got that right") is an instance of factum valet. The action that was otherwise prohibited by rule, i.e., helper arranging, is counted as acceptable once it is done. In this case, the violating act is treated not only as acceptable, but as laudable and even worth claiming some credit for.

In treating Mary's action as a factum valet Joan brings to light a feature of all rule systems (Garfinkel, 1967), a feature which our previous cases did not clearly reveal. Joan and Mary are free to treat the system of rights and responsibilities as both resources and constraints. Compliance with normative order is everywhere contingent and risk-filled (20). Persons do not have to comply with rules: choice is involved.

In the second instance of helper arranging we see Joan "managing" the consequences of Mary's move. A rule violation is overlooked in the face of its success. In a sense, Joan "lifts" the very organization of preference which she otherwise can be interpreted as supporting. In this "lifting" we are shown the possibility that tasks can be accomplished without apparent compliance with normative order, or, without apparent compliance at every turn (21). Students are not governed by rights and responsibilities. They use rights and responsibilities to understand and conduct their interactions within the task environment of collaborative computer editing, given their understanding of the prevailing circumstances.

6) Finally, what do we learn from discussion of the previous five questions?

I see three things we need to appreciate.

First, case 4, in its two relevant segments reveals a tension internal to the normative order which the students can be seen to use. That tension is the helper's responsibility for arranging screen states and the preference for writer arranging.

From the answer to question one we see that Mary's initial attempts to engage in arranging moves could be based on her sense of responsibility for the state of affairs confronting her and Joan. In the answer to question three we saw that Mary's sense of responsibility could have motivated her to act, in spite of the writer's right to arrange. This situation is an instance where the helper had grounds to believe that her idea for an arranging move had been rejected, thus a directive would do no good.

A feature of interest in this normative order is that its functioning allows "problem circumstances" to arise. The problem exists whenever the helper's directive, or idea for a directive, can be interpreted as rejected by the writer. Perhaps because such circumstances did not often arise, the normative system (22) itself had no way of reconciling conflict between helper sense of responsibility and writer sense of right.

Second, while the normative system had no way of resolving helper-writer differences, such differences got resolved, by helpers and writers. The resolution, as in the two instances in case 4, was achieved via devices external to the normative system of rights and responsibilities, but pervasive within and beyond the domain of its operation. Mary uses one of these devices: "Wait!" For lack of a better term, I call devices used in this manner "forestallers."

Forestallers lift the relevance of the action under consideration. While use of the device has an instrumental character, being oriented to the accomplishment of the action at hand, the normative value of the device is moral. Not to delay an action where a forestalling device has been used is to invite evaluation of one's behaviour in moral terms: one has performed an action where another person has opposed it. If one does not stop to find out the other person's reason for wanting to forestall the action (23), then one can be seen as not respecting other persons. And "respect" is a moral issue transcendent to the operation of (most) normative, task-oriented systems.

Third, we have seen how Joan "managed" the interaction around the outcome produced by Mary's (apparent-to-Joan) violation of the preference for writer arranging. Joan issued congratulations and then formulated the outcome as a joint achievement: "we got that right."

Joan's actions bring out the character of the normative system as something used by the collaborators, and overridden, "lifted," if need be. Something else is also to be seen, having to do with the intertwining of the instrumental and moral dimensions of interaction.

Joan publically counted Mary's violation as a success. Its success was instrumental. Hitting the space bar served to move the cursor toward a goal they both seemed oriented to: repairing the screen state, returning it to its original condition so as to get on with the corrections.

Note that Mary's violation, her hitting the space bar after saying "I think space," revealed a tension between helper responsibilities and writer rights for arranging. The violation, as it could have been so interpreted by Joan, was a moral issue, not an instrumental one. It would be more efficient for helpers just to go ahead and do arranging moves rather than give directives to writers. But this is not what the rules prescribe. Case 4 allows us to see that the preference for writer arranging is a moral preference.

We can appreciate the intertwining of the moral and the instrumental when we see that instrumental grounds were used by Joan to reestablish a "moral balance" between Mary and herself after the violation of the moral preference for writer arranging. In saying "we got that right," Joan artfully elides the moral violation involved and establishes with Mary that "all is all right, and all is forgiven" (24).

What points two and three bring out is that there is a strong moral dimension to collaborative computer editing. Persons orient to how others will perceive their actions, morally. And moral devices, like forestallers, are available to get the instrumental work done in ways respectful of moral concerns. And this is all to the good, for without the moral dimension and the devices serving it, the tension between responsibilities and rights could not be "managed." Collaboration could not succeed and editing could not get done.

CONCLUDING REMARKS

Through various moves and turns this essay has sought to establish that grounds existed for each of two students to believe that their fellow collaborator was oriented to the normative order of rights and responsibilities which I have here portrayed. Through four cases we have formulated and analyzed student interactions on a move by move, turn by turn basis. Those cases have served to show that the relation between helper and writer rights to engage in arranging moves is ordered: there is a preference for writer arranging over helper arranging. Cases 1 and 2 demonstrated the nature and existence of the preference system. Case 3 showed how the system allows for the lifting of preference. And Case 4 gave us a glimpse of the management of system-based tensions and personal relations under anomalous circumstances.

The analyses taken collectively establish what it means to attempt the recovery of culturally possible ways of doing things, in this case, collaboration at a computer while engaged in editing activities. The ways portrayed are the ways hearer/witnesses, including ourselves and the students, could have understood events as they unfolded in real time, over the course of their occurrence. And in seeing how they could have been understood we have articulated ways in which cultural activities can be organized in a move by move manner across the exigencies of real life circumstances.

What we have come upon by taking this situated perspective are the ways in which normative systems can be managed and the conditions under which such management is vital. Those conditions have to do with structural issues transcendent to the organization of rights and responsibilities which I have here catalogued. These are issues of moral order.

Indeed, the operation and maintenance of the preference for writer arranging is a moral matter. It may have had its genesis in circumstances where the writer was supposed to learn better how to use the computer, by having the first opportunity in each instance to use the executive keys, under direction from a more experienced helper. But that rationale has evaporated over the year as students have learned their rights, and guarded them. Recall Case 1, where Mary could have pressed the space bar, but instead just touched it while telling Joan what to do. From a purely instrumental point of view, Mary wasted time touching the space bar when she just as easily could have pressed it. Mary's displayed orientation was to the preference for writer arranging as a moral requirement.

In each case we see that the preservation of the preference for writer arranging moves is a moral issue. Something more is "on the line" for students than questions of competence at completing the Correction Interpretation and Screen Document Reformation phase of editing. At issue is their moral competence as reflected in and by the actions of Others, which respect or question that competence. In accomplishing a task together students are collaboratively achieving a goal, but they are also collaboratively achieving, sustaining and contesting their moral profiles, their value, their identities. Little wonder, then, that friends rather than computer experts are typically chosen as helpers.

Having produced an account of the social organization of collaborative computer editing, it is now possible to return to questions posed in the introduction to this essay. I cannot yet answer the question of which is preferable at the Primary level, wordprocessing in a solo or collaborative mode. An answer to this question requires attention to the organization of all phases of both modes of computer writing. What I can note from my efforts here is that collaborative and solo writing differ in one fundamental way.

We have seen that collaboration during a computer editing session depends on a social organization which serves both instrumental and moral values. The organization of solo writing, though, is solely instrumental. The solo writer need not worry about the rights of others. Solo writing is an instrumental activity, characterizable by the sort of product oriented rationality represented in cognitive theories of writing (e.g., Hayes and Flower, 1980). In sociological terms, the model of actor and action appropriate for solo writing is not a model fully appropriate for collaborative writing. Certainly, collaborative writing can be characterized in instrumental terms, but the management of such writing effort, and indeed its organization as a preference system, depend on orientation to writers moral.

Thought will have to be given to the consequences which flow from this fundamental difference between collaborative and solo writing. It seems clear, though, that children engaged in collaborative writing have more to worry about than just the best way to write (compose, edit, input, and arrange). They have to worry about moral issues, e.g., whether their rights are being respected, whether the other person's rights are being respected. No time need be devoted to these concerns in solo writing.

On the other hand, the consequences of the pressure of moral matters on writing skill acquisition in collaborative settings will have to be balanced against the advantages of collaborative over solo writing modes. Preliminary consideration suggests that such advantages are attractive. Based on a pilot study I argued that collaboration may aid students in appreciating texts as meaningful in ways they hadn't intended. Collaboration also may foster a sense of audience and serve to develop abilities of self-regulation needed by writers (see Heap, forthcoming).

Before making any decision about how computers should be used in classrooms, or elsewhere, what needs attention are the various socially organized ways persons have of using computers, collaboratively and in "sit alone" modes. In this essay I have sketched one such organization. It is not the only culturally possible way joint editing can be done, but the sketch does represent what a "culturally possible way" looks like, and how it can be seen.

NOTES

1) The difficulties were doubled by the fact that the wordprocessing program used operated only in the "overtyping" mode, with no optional "insert" mode. It was not until students tried to edit their stories that they realized that hitting the space bar in the middle of a line of text would overtype the character to the right of the cursor, while moving the cursor right one space. This feature of the space bar's operation was not always understood by students, who just worked around it. In phenomenological terms, the properties of the space bar, its effects, became unpredictable, even though the space bar's objective operation did not vary in its effects from the composing phase of writing. Students simply did not realize that they were "creating space" on the screen when they used the space bar to move the cursor at the point of inscribing their stories. Rather, they seemed to understand the computer monitor's screen as like a blank sheet of paper, with space as far as the eye can see.

2) I use "styli" and "stylus" as generic terms to cover all sorts of writing implements: pencils, crayons, chalk, ballpoint pens, fountain pens, quills, light pens, brushes---anything which is held (usually by hand) in order to make an impression or mark on some surface.

3). The argument requires a long treatment, but can be hinted at here. All Ethnomethodological critiques of the use of rules by analysts to explain human action depend on an explication of how members of a linguistic community use rules. (The latter explication broke new ground (Garfinkel, 1967) but remains today still largely unappreciated.) That explication was from what I have called a "situated perspective" (Heap, forthcoming). However, that perspective is the perspective only of the hearer/witness, the receiving participant in any social interaction. From this hearer situated perspective, rules are interpretive devices whose use serves to constitute the features of the setting, the scene, wherein they are used (see Heritage, 1984 for a clear account).

The situated perspective of the speaker/actor is rarely considered or examined in Ethnomethodology (but see Zimmerman, 1970), though it is recognized that rules (normative order) can have a guiding or regulative character for speaker/actors (this is implied in Coulter, 1983, chapter 3). The reason that Ethnomethodology makes rare analytic use of the guiding, regulative character of rules, which everyone else depends on in explaining human action, is that a good part of Ethnomethodological effort has gone into demonstrating that 1) rules have an "open texture of application"; they require interpretation for their application, and they underdetermine action, thus 2) rules cannot be used, with certainty, to explain other persons' actions sufficient to the scientific needs of deductive explanation.

What I am proposing is that we cannot work with an understanding of rules as **solely** interpretive devices for constituting scenes of action. Rules would never be used by hearer/witnesses (as interpretive devices) if they did not, generally or pervasively, guide the actions of speaker/actors. How they might guide action, as part of the social organization of any activity, should be a topic for any sociology which wishes to offer a persuasive account of social organization.

4) The attentive reader will have noticed my odd ordering of pronouns; first "her or him," then "he or she." I follow the rule that gender specific pronouns should be ordered solely alphabetically. In relation to this rule, the decision to replace "Him" with "Him or Her" is to be lauded, but is still unfortunate. Why should Him precede

her? And equally, why should the reverse tactic be accepted, always placing the female pronoun first? Happily, the alphabet rule gives both genders a chance to be serially first.

5) With regards to responsibilities, at both the second and third levels, a point of clarification must be made. Whoever has the right to hit a key, whether it is a display or an executive key, has responsibility for the effects achieved in attempting to hit that key. While the student may have intended to hit a cursor key, if a period is thereby displayed on the screen, that student is treated as responsible for that mistake. This is an abiding feature of social interaction, and is not the feature which Figure 1 seeks to render in formulating "responsibility" at levels two and three. Rather, responsibility in Figure 1 refers to responsibility for what ought to be input, or arranged, not responsibility for what ends up on the screen, inadvertently.

6) On occasion there was more than one student acting as a helper. However, such persons were not "designated helpers." Nor did they stay around for the whole session of editing. Assuming a world supplied with copious amounts of free time, rules relevant for and to such persons will be formulated later.

7) The use of "know" here is not intended to be overtly cognitive. I do not assume that persons always or necessarily represent interactional rules relevant to an Other's behaviour as propositions to which they take what Fodor calls a propositional attitude (Fodor, 1981). Rather, I use know to mean: would not be surprised if Other asserted the right in question. Rather than the representational model of mind, which places a subject in relation to an object/representation, I here prefer a more existential model, where the subject is understood to be interior to, or selfsame with, the rule which animates her or his action. On the representational model of mind, see Fodor (1981) and Husserl (1962). On the existential model, see Heidegger, 1962 and Robillard, 1974.

8) Of course, discourse is action, but for purposes of economy and clarity, I shall contrast discourse action with non-verbal action. The former will be called discourse and the latter will be called action.

9). It is interesting to note that in chapter two of Sacks' unpublished manuscript on aspects of the sequential organization of conversation (Sacks, n.d.), he formulated the turn taking machinery of conversation as concerned with a next action, not a next turn at talk. However, his use of "action" included talk. The manuscript was written prior to the publication of the classic paper on the turn taking system by Sacks, Schegloff and Jefferson (1974).

10) My use of "directive" seems consistent with Sinclair and Coulthard's, though they use "reaction" where I prefer "compliance" (Sinclair and Coulthard, 1975). Also, they do not formulate their discourse moves in terms of sequences, whereas, following my colleagues in conversation analysis, I do.

11) As actual occurrences of helper arranging moves rarely occur in circumstances matching the simple state of affairs presupposed by my hypothesis, we shall have to treat it as a "working hypothesis," i.e., one that I like but cannot prove.

12) This argument has been developed in relation to judgments about person's reading skills (Hepp, 1980a). The formal features of judgments about any mental states held by Other should be the same as those formulated in that earlier paper.

13) The teacher operated as a consultant to the project and received an honorarium for filling out a written profile on each student. In

any classroom study, and especially one which packs a classroom with wires and electronic equipment, teacher cooperation is an essential prerequisite to successful data gathering. We were most fortunate, as the teacher we worked with was most cooperative and helpful. She is regarded as a pioneer and expert in the use of wordprocessing in the early Primary years. Her insights have proved invaluable.

14) Following the convention of the research officer on the project responsible for initial transcription of videotaped material, Ms. Christine Bennett, I distinguish between deletion keystrokes, which remove characters as well as spaces in a document, and erasure keystrokes, which replace one character with another character or space. An erasure move overtypes whatever is on the screen at, or to the right or left of, the cursor. (An inputting move can function as an erasure: at this point inputting and arranging overlap.) A deletion move sucks a space off the screen, along with whatever occupied that space.

The wordprocessing program the students used is in a permanent overtype mode: hitting the space bar erases the character to the right of the cursor. The "delete key" deletes the space (and character) to the left of the cursor. The program compensates, or requires the user to compensate, for deletions by inserting a space with the "insert key." (See Appendix A for the keyboard layout of the computer which the children in our study used.)

15) I include time information in minutes, seconds, and occasionally tenths of seconds in order to give the reader a sense of the pacing of interaction and an idea of how swiftly the preference organization is displayed. Sometimes the children's keyboarding oriented moves transpire in two tenths of a second. A technology (and a viewer) unable to recover such actions cannot gain access to the details of preference organization. Ethnographic studies based solely on one-time-through observation have some chance of catching such micro-organizations, but only if the observers know what to look for. But such studies have no way of convincing an audience of the existence or details of such organizations.

16) My conjecture is that Mary was pointing to column 6 when she issued a directive to "put the cursor right there." If this is where she was pointing, and if Joan had successfully complied with Mary's directive, the screen document would have appeared as follows:

12345*7890

Last week I went to the C.N. Tower

The next move would have been to input a 'w' in column 6, which would have reformed the screen document back into its initial state at the commencement of the editing session.

The keys that would have needed to be pressed to move the cursor over one space to the right, from column 5 to 6, were the Shift key and the right-angle-bracket/period key (>.). It so happens that the first cursor move which Mary directed Joan to make in this editing session was this one. Joan did not know how to do it. Mary took Joan's right hand and pressed a finger down on the left Shift key. Mary then took her own right hand and pressed the right angle-bracket/period key twice. Two periods were displayed on the screen. In surprise Mary exclaimed "I'm erasing!"

What happened is that Joan did not maintain pressure on the Shift key, so periods overtyped the 'L' and 'a' of the first line. The intended cursor move that misfired here is the move that the students desperately needed in order to "cursor-through" a line of text to get

to the end of the line, where the hard copy indicated a correction should be made (the placement of a period after "Tower"). Not until eight minutes into the editing--eight minutes concerned solely with repairing the damage they do to the initial screen document--does Mary re-attempt the Shift/right-angle-bracket cursor move. She succeeds. 17) It is interesting to note that Joan input the word "last" from memory. A fascinating feature of wordprocessing is that if you can remember (how to spell) words you have also remembered which keys to hit in order to input the words. When writing with a stylus, the formation of the characters composing the word must be remembered "in the muscles," as it were. A stylus will not serve to remind you how to use it to form characters.

A further feature of wordprocessing is that remembering the spelling of the word will tell you which display keys to hit, but not which executive keys need to be hit to arrange words and symbols on a screen. Whereas, when writing with a stylus, there are no separate "formations" which must be learned "in the muscles" in order to arrange words and symbols on a surface. One simply lifts one's hand (or head or foot, for the handicapped) and moves the stylus to another position on the writing surface.

The moral of this story is that while Joan remembered how to spell "Last," her internal representation of "Last" did not provide (semantic) information regarding how to arrange the word on the screen in relation to the rest of the sentence token of which it ostensibly was a part. So, Joan's ability to remember and input "Last" provided Mary with no evidence that Joan knew what to do next: move the cursor, e.g., with the space bar.

18) How long her series is, or will be, can be decided only by Mary: there are no conventional units which define the length of a "series" of such arranging moves. If Mary were inputting a word, then we could project how long her series would last if we had reasonable hypotheses about what word she was inputting. In the instance under review, where spaces are being inserted, there is no way for a co-participant to decide how long the arranging series will continue, i.e., Joan has no way of knowing how long before her question will be "taken off hold."

19) This type of "managing" work is visible by Mary at a number of points in our tape. In one case, at minute 9:50.7, where Joan joins in and controls Mary's arranging move, by pressing her finger on top of Mary's as Mary prepares to hit the insert key, Mary turns on Joan and implies that that was a foolish move. While the move created more of a problem than it solved, it does appear that it was a move that Mary was intending to make herself. Her discourse seemed concerned to remove responsibility for the act from herself, as if she knew it wasn't a wise move in the first place.

20) This applies only to humans following rules. Computers, which are claimed to follow rules, in no way face the type of contingency or risk humans face. Searle goes so far as to say that computers do not follow rules, they only execute programs (Searle, 1984).

Of course, my claim that Joan and Mary could be following rules, or that their actions allow each other to believe that they are following rules, should not be read as a claim that all of their behaviour, or all of human behaviour, is based on rule following (see Dreyfus, 1979: chapter 8; Heritage, 1984: chapter 5; cf. Dreyfus and Dreyfus, 1986: chapter 1).

21) The use of "apparent" is important here. I am not making claims about rules persons actually did nor did not comply with. I am concerned with what rules they could appear to have complied with.

The difference is between phenomena visible from a situated, first person perspective and phenomena visible from a situated, third person perspective. The former is the perspective of the speaker/actor as he or she speaks/acts. The latter is the perspective of the listener/witness as he or she listens/witnesses.

When adopting a first person perspective, Phenomenology is an informative guide. When adopting a third person perspective, the Analytic Philosophy of Wittgenstein, Austin and Ryle is helpful. Ethnomethodology draws on both types of philosophy but typically takes a third person situated perspective.

22) The phrase "normative system" is here used to denote the rules each person could use to interpret the recognizably patterned actions of other persons as rule guided actions. There is also the possibility with any normative system that each person's actions actually might be rule guided.

Unless an observer is also an actor within the system which he or she describes, there can be no claims of certainty as to whether any of the rules of the system actually guided the behaviour of an actor. If the observer is also an actor, then the observer can make claims about her or his own action as rule guided (see Heap, 1975).

23) The beauty of a forestaller is that its use can forestall action without reasons being provided as to why the action should be forestalled. And if the other person, the one intending or required to do the action, stops to find out the speaker's reason for wanting to forestall the action, the action is thereby forestalled, if only briefly.

24) It would appear that "all is forgiven" because "all is all right," on the screen.

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APPENDIX A

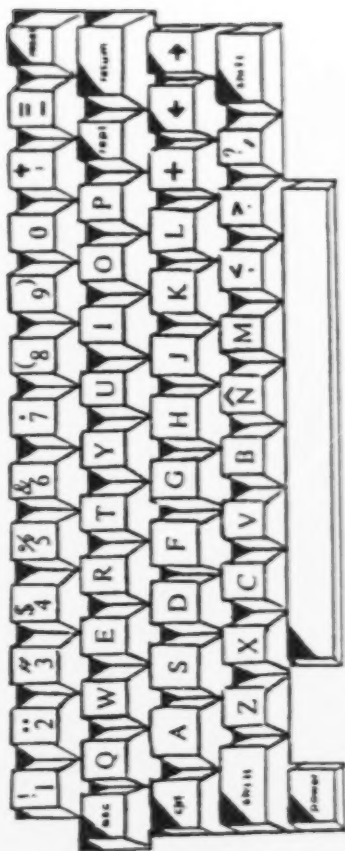
APPLE II+ KEYBOARD

Note the keys with the shaded corner: esc, ctrl, shift, power, space bar, rept, return, reset, right arrow, left arrow. The arrow keys are among the most important in editing. The right arrow key inserts a space to the right of the cursor, without moving the cursor. The left arrow key deletes the character and space to the left of the cursor, and also moves the cursor one space left.

In the composing and editing phases of writing, these are the "executive" keys. The rest of the keys used in these phases are "display" keys.

Display keys used in combination with executive keys lose their display function, as when used for cursor movement.

Cursor movements which do not affect the arrangement of characters are ctrl/T for one line up, ctrl/B for one line down, shift/right-angle-bracket for one space right, shift/left-angle-bracket for one space left.



(drawing produced by Ms. Christine Bennett, Research Officer, Project on Socio-Cultural Organization of Writing, OISF)

APPENDIX B

STUDENT PROFILE: Joan

Joan, a repeating Grade 2 student, was rated by her teacher as "average" to "weak" in reading skills and generally "average" in writing skills and development. Although well motivated with self-chosen activities, Joan showed less independent initiative and self-direction in completing required academic tasks. In this regard, teacher evaluations of Joan's assigned written work located difficulties with reading comprehension and a pattern of carelessness. Her competence at the computer was rated as "average" to "minimal". This resulted in Joan's unavoidable dependence on technical assistance from others and she did not hesitate to ask for help from a variety of peer helpers during computer writing.

Joan was a socially energetic and outgoing student. Her actions were frequently enough outside, or in disregard of, established classroom routines and requirements, that she drew attention to herself, causing disruptions and difficulties with the teacher and with her peers.

According to her teacher, Joan frequently wrote "on her own" at her desk and at home. Indeed, Joan was the first student to use the Writing Centre after taping began in the fall of 1985 and she can be observed on several early classroom recordings, writing alone on her stories. However, later videotapes of sessions at the Writing Centre and, particularly, Computer Centre activities (Spring, 1986), clearly show Joan oriented to, and seemingly preferring, peer collaboration during story writing. The episode at the Computer Centre involving the editing of Joan's story "Miami Vice", with Mary as peer helper, illustrates Joan's collaborative orientation during computer writing.

Finally, the collaborative editing episode between Joan and Mary, which is fraught with persistent difficulties in document reformation, reveals additional interesting dimensions to Joan's personality. Interactions with Mary point to shortcomings in Joan's word processing skills. Yet, on the level of sociality, we can observe Joan's adaptive competencies at work, including effective use of humour, the ability to maintain collaborative morale, and high frustration tolerance in the face of considerable problems with using the editing functions to correct her story. Joan's determination and motivation to edit her story successfully are prominent features of her profile as a writer.

(profile produced by Mr. Shawn Moore, Research Officer, Project on Socio-Cultural Organization of Writing, OISE)

APPENDIX C

STUDENT PROFILE: MARY

Mary was a cooperative and sociable Grade 2 student. Both Portuguese and English were spoken in her home. Although she had repeated Grade 1, teacher evaluations indicated Mary's reading and writing skills, compared to others in Grade 2, were below average. In addition to problems in the areas of sight vocabulary and decoding skills, Mary experienced difficulties in reading comprehension and understanding.

According to the teacher, Mary did not write at her desk and displayed little initiative in engaging in the variety of writing opportunities which were readily available and encouraged. Mary's interest in writing at the Computer Centre was rated as "average", but "minimal" at the Writing Centre and with regard to her daily journal. On the few occasions Mary was observed at the Writing Centre or Computer Centre, she displayed a preference for peer collaboration over independent writing.

Classroom observations of her writing activities and interactions suggested that Mary's social orientation came into play as a compensatory factor for academic deficiencies. Namely, Mary's natural social orientation, her apparent enjoyment of conversation, fit well with a basic requirement of successful collaborative writing -- social coordination of writer-helper talk and physical interactions in relation to the writing task. From this perspective, Mary's preference for social collaboration during writing was both understandable and practical. Seeking out and using a peer helper during writing met Mary's dependency needs by providing her with personal support and direction from an immediate audience.

Despite the fact that Mary's competence level at the computer was rated as "average" to "minimal," she was chosen occasionally by other students as a peer helper, probably more for social than technical reasons. When acting as a designated helper at the Computer Centre, Mary's relative lack of word processing skills became most apparent during the editing phase of writing.

In general, Mary's developmental deficiencies in reading and writing affected her ability and motivation to undertake solitary writing activities. However, Mary's orientation and preference for social interaction during writing enabled her to develop and experience successful collaborative relationships.

(profile produced by Mr. Shawn Moore, Research Officer, Project on Socio-Cultural Organization of Writing, OISE)

APPENDIX D

PARTIAL TRANSCRIPT OF CASE 4

1 M- ((inserting spaces with insert-space key)) 11:19.2
2 J: Okay, what am I doing now? ((spoken while M is still
inserting spaces.))
3 M: Okay, sto/ sto/ ((M puts her hand to her face))
4 J: Okay, what am I doing now? ((looks at hard copy.))
5 M- ((reaches across to keyboard))
6 J- ((grabs M's hand and pulls it away))
7 M: Wait! Wait!
8 M- ((hits delete key twice, no change on screen))
9 J: I'll break you fingers girl.
10 M- ((hits delete key perhaps three more times, no change))
11 J: Don [Don't
12 M: [But how?//
13 J: //Don't worry, I'll get Peter to do it.
14 Peter, I'm gonna kill myself.
15 M: How did you move that over here? ((points to screen))
16 J- ((presses Shift and 'L'. Then presses 'a', 's', then 't'.))
17 M: I think space.
18 M- ((reaches to hit the space bar.))
19 J- ((grabs M's hand and pulls it away.))
20 J: No.
21 M: Wait.
22 J- ((regains contact with M's hand))
23 M- ((presses the space bar once.))
24 MAJ- ((pleased responses))
25 J: Oh, good girl, well, we got that right. 11:49.6

(based on original transcript produced by Ms. Christine Bennett,
Research Officer, Project on Socio-Cultural Organization of Writing,
OISE)